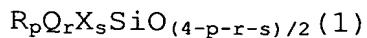


CLAIMS

1. A photosensitive resin composition for a laser engravable printing substrate, which comprises a resin (a) having a polymerizable unsaturated group having a number average molecular weight of 1000 or more and 200000 or less, an organic compound (b) having a polymerizable unsaturated group having a number average molecular weight of less than 1000, and an organic silicon compound (c) having at least one Si-O bond in a molecule and having no polymerizable unsaturated group in the molecule, wherein a content of the organic silicon compound (c) is 0.1 wt% or more and 10 wt% or less based on the total amount of the photosensitive resin composition.
2. The photosensitive resin composition according to claim 1, wherein the organic silicon compound (c) has a number average molecular weight of 100 or more and 100000 or less, and is liquid at 20°C.
3. The photosensitive resin composition according to claim 1, wherein the organic silicon compound (c) comprises a silicone compound represented by the average composition formula (1):



wherein R represents one or more hydrocarbon groups selected from the group consisting of a linear or branched alkyl group(s) having 1 to 30 carbon atoms, a

cycloalkyl group(s) having 5 to 20 carbon atoms, an unsubstituted or substituted alkyl group(s) having 1 to 20 carbon atoms, an alkoxy group(s) having 1 to 20 carbon atoms, an alkyl group(s) substituted with an aryl group and having 1 to 30 carbon atoms (the number of carbon atoms before the alkyl group is substituted), an aryl group(s) substituted with a halogen atom and having 6 to 20 carbon atoms, an alkoxycarbonyl group(s) having 2 to 30 carbon atoms, a monovalent group(s) containing a carboxyl group or a salt thereof, a monovalent group(s) containing a sulfo group or a salt thereof, and a polyoxyalkylene group(s),

Q and X each represent one or more hydrocarbon groups selected from the group consisting of a hydrogen atom, a linear or branched alkyl group(s) having 1 to 30 carbon atoms, a cycloalkyl group(s) having 5 to 20 carbon atoms, an unsubstituted or substituted alkyl group(s) having 1 to 20 carbon atoms, an alkoxy group(s) having 1 to 20 carbon atoms, an alkyl group(s) substituted with an aryl group and having 1 to 30 carbon atoms,

an aryl group(s) substituted with a halogen atom and having 6 to 20 carbon atoms, an alkoxycarbonyl group(s) having 2 to 30 carbon atoms, a monovalent group(s) containing a carboxyl group or a salt thereof, a monovalent group(s) containing a sulfo group or a salt

thereof, and a polyoxyalkylene group(s), and
p, r and s are numbers satisfying the
formulas:

$$\begin{aligned}0 < p &< 4, \\0 \leq r &< 4, \\0 \leq s &< 4, \text{ and} \\(p + r + s) &< 4.\end{aligned}$$

4. The photosensitive resin composition according to claim 3, wherein the silicone compound comprises a compound having at least one organic group selected from the group consisting of an aryl group, a linear or branched alkyl group substituted with at least one aryl group, an alkoxy carbonyl group, an alkoxy group and a polyoxyalkylene group, and having a hydrogen atom (α position hydrogen) bonded to a carbon atom to which the organic group is directly bonded.

5. The photosensitive resin composition according to claim 4, wherein the silicone compound has at least one organic group selected from the group consisting of a methylstyryl group, a styryl group and a carbinol group.

6. The photosensitive resin composition according to claim 1, wherein the organic silicon compound (c) comprises a compound having at least one organic group selected from the group consisting of an aryl group, a linear or branched alkyl group

substituted with at least one aryl group, an alkoxycarbonyl group, an alkoxy group and a polyoxyalkylene group, and having a hydrogen atom (α position hydrogen) bonded to a carbon atom to which the organic group is directly bonded.

7. The photosensitive resin composition according to claim 1, further comprising a photopolymerization initiator, wherein the photopolymerization initiator comprises at least one hydrogen extraction photopolymerization initiator (d).

8. The photosensitive resin composition according to claim 7, wherein the photopolymerization initiator comprises at least one hydrogen extraction photopolymerization initiator (d) and at least one degradable photopolymerization initiator (e).

9. The photosensitive resin composition according to claim 8, wherein the hydrogen extraction photopolymerization initiator (d) comprises at least one compound selected from the group consisting of benzophenones, xanthenes and anthraquinones, and the degradable photopolymerization initiator (e) comprises at least one compound selected from the group consisting of benzoin alkyl ethers, 2,2-dialkoxy-2-phenylacetophenones, acyloxime esters, azo compounds, organic sulfur compounds and diketones.

10. The photosensitive resin composition according to claim 7 or 8, wherein the photopolymerization initiator comprises a compound

having both of a site functioning as the hydrogen extraction photopolymerization initiator and a site functioning as the degradable photopolymerization initiator in the same molecule.

11. The photosensitive resin composition according to claim 1, wherein the resin (a) is liquid at 20°C, and the resin (a) and/or the organic compound (b) are compounds having a molecular chain having at least one bond selected from a carbonate bond, an ester bond and an ether bond, and/or having at least one molecular chain selected from the group consisting of an aliphatic saturated hydrocarbon chain and an aliphatic unsaturated hydrocarbon chain, and having an urethane bond.

12. The photosensitive resin composition according to claim 1, wherein a coating layer of the photosensitive resin composition having a thickness of 1 mm has a haze of 0% or more and 70% or less.

13. The photosensitive resin composition according to claim 1, which is liquid at 20°C.

14. A laser engravable printing substrate obtained by photo-curing a photosensitive resin composition, wherein the printing substrate comprises an organic silicon compound in an interior and/or on a surface thereof, and Si atoms originating from the organic silicon compound is contained in an abundance ratio of 0.01 wt% or more and 10 wt% or less when the organic silicon compound is detected and quantitatively

determined using solid ^{29}Si NMR (solid nuclear resonance spectrometry in which an observed nucleus is Si having an atomic weight of 29) and plasma emission spectrometry in combination.

15. A laser engravable printing substrate, which can be obtained by molding the photosensitive resin composition according to claim 1 into a sheet or cylinder and then crosslinking and curing the sheet or cylinder by applying light.

16. The laser engravable printing substrate according to claim 14 or 15, having a surface subjected to at least one processing selected from the group consisting of cutting processing, grinding processing, polishing processing and blast processing after crosslinking and curing by application of light.

17. The laser engravable printing substrate according to claim 16, wherein an elastomer layer is formed by curing the photosensitive resin composition that is liquid at normal temperature.

18. The laser engravable printing substrate according to claim 16, wherein an outermost surface layer of a laminate is a layer which can be engraved using a near infrared laser.

19. A laser engravable printing substrate comprising a photosensitive resin composition, wherein the laser engravable printing substrate has a surface with a wettability characteristic such that when 20 μl of an indicating liquid with a surface energy of 30 mN

("Wetting Tension Test Mixture No. 30.0" (trademark) manufactured by Wako Pure Chemical Industries, Ltd.) collected using a quantitative and fixed type micropipette is added dropwise onto the surface and a maximum diameter of an area where the droplet spreads is measured after 30 seconds, the diameter of the droplet is 4 mm or more and 20 mm or less.

20. The laser engravable printing substrate according to any one of claims 14 to 20, which is a flexographic printing original plate or a letterpress printing original plate or a screen printing original plate on which patterns are formed using a laser engraving process, or an ink amount adjusting roll which is used in contact with an ink transferring blanket or an anilox roll on which no patterns are formed.